BROWN UNIVERSITY Providence, Rhode Island •02912

DEPARTMENT OF GEOLOGICAL SCIENCES
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April 18, 2011

Dr. Marcia McNutt, Director
U. S. Geological Survey, MS 905
12201 Sunrise Valley Drive
Reston, VA 20192

Dear Marcia:

I am writing to convey the report of an independent panel of experts convened by NEPEC to review the seismic hazard represented by the New Madrid Seismic Zone (NMSZ). There are substantial uncertainties regarding the size, location and frequency of both past and future large earthquakes in the region, and with respect to the underlying causes of earthquakes in this intraplate setting. Consequently, scientists and engineers are debating the level of earthquake hazard and whether that hazard is well-represented in the USGS national seismic hazard maps. On the occasion of the bicentennial of the 1811-12 New Madrid earthquake sequence, we decided that a fresh look would be helpful. We are very pleased that we were able to convince such a distinguished group to take on this task, and that they were able to devote considerable time and energy to study of this issue.

We assembled a panel that includes expertise across a suite of relevant areas, including tectonics, intraplate earthquakes, Earth structure, GPS strain monitoring, liquefaction, paleoseismology, postglacial rebound, strong ground motion, lithospheric mechanics, geodynamics, hazard mitigation, and probabilistic seismic hazard analysis. They did not have any vested interests in the outcomes of the review with respect to the hazard and its representation. The panel met numerous times by conference call, and held a two-day meeting in Memphis, Tennessee in mid-March, in which they interviewed a number of key technical experts and those representing the user community, having different perspectives on the issues. The panel received over 40 letters from scientists, engineers, public officials, and members of private businesses and trade groups in response to my open invitation. They also received many comments in response to a draft report released on April 1.

NEPEC has reviewed the report of our independent expert panel and discussed it in our meeting in Memphis, TN on April 16, 2011. The charge to the panel and its membership are included in their report and will not be repeated here.

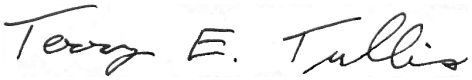
We find the panel's report to be an extremely useful and carefully prepared document that presents a balanced summary of what is and is not known about the seismic hazard in the NMSZ. The panel found that despite considerable uncertainties about the underlying origins, nature and history of earthquakes in the region, the seismic zone is at significant risk for damaging earthquakes, which must be accounted for in planning and development.

The panel also examined the USGS national seismic hazard maps and the process by which they are produced and updated. They concluded that the hazard maps employ a scientifically sound, carefully implemented, open, and consensus-based process that incorporates a range of scientific data, views and interpretations, and represents the best means available to refine hazard estimates. The panel also recommended that the 2008 national maps should continue to be used until they are updated in 2013.

The report acknowledges that uncertainties in our knowledge are sufficiently broad that the current USGS national hazards maps could somewhat overestimate the seismic hazard within the NMSZ. The panel also offers useful suggestions about future research efforts—both within the NMSZ and in the broader central US region—that could reduce the uncertainties in future updates to the seismic hazard maps. Although new research findings have the potential to change the estimated hazard, significant seismic hazard in the NMSZ and broader central US region is evident.

On behalf of NEPEC I am pleased to pass this report on to you with our recommendation that it be carefully considered. We would be happy to answer any questions that you may have.

Sincerely,



Terry E. Tullis
Professor, Emeritus and Research